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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,784	07/05/2001	Dong-Su Kim	5000-1-212	2355

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EXAMINER

TOLEDO, FERNANDO L

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/899,784	Applicant(s) KIM, DONG-SU	
	Examiner Fernando Toledo	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 – 20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In re claim 1, discloses the limitation partially depositing an etch stop layer, it is not clear what Applicant meant by partially depositing an etch stop layer. How can a layer (any layer) be partially deposited? How is the rest of the layer placed? Is it a combination of depositing and growing? Is more than one method use to place the layer?

For purpose of the rejection, Examiner assumes that the etch stop layer is selectively deposited on an etching area of a first silica layer. If Applicant disagrees with the Examiner's assumption, the Applicant is encouraged to state the reasons on why the Examiner's assumptions were incorrect.

In re claim 2, discloses the limitations depositing a photoresist layer on the silica layer; patterning the photoresist layer; forming the etch stop layer on the surface of the photoresist and the first silica layer; removing the photoresist layer. What happened to the etch stop layer on the photoresist layer? If the photoresist layer is removed, the

etch stop layer on top of the photoresist is also removed, but wouldn't it remove the etch stop layer inside the patterns of the photoresist layer?

Claim Objections

Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 9 discloses the exact same limitation as claim 8. Although claim 8 is directly dependent on claim 1, claim 9 is dependent on claim 7, which in turn is dependent on claim 1, therefore, the parent claim (claim 1) is not further limited by the limitations of claim 9.

Claims 10 – 20 pertain to a device while the Application pertain to a method hence they do not have patentable weight.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 3, 6 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Chan et al. (U. S. patent 6,306,706 B1).

In re claim 1, Chan, in the U. S. patent 6,306,706 B1; figures 1 – 5 and related text, discloses selectively depositing an etch stop layer P1 on an etching area of a first silica layer formed on a semiconductor substrate (figure 5c); forming a second silica layer on the surface of the etch stop layer and the first silica layer (figure 5d); forming a mask patterned according to the shape of the etching area on the surface of the second silica layer (figure 5e); removing the second silica layer from the etching area using the mask by dry etching (figure 5e); removing the etch stop layer by wet etching (figure 5e).

In re claim 3, Chan discloses forming the etch stop layer on the first silica layer; forming a photoresist layer on the etch stop layer; patterning the photoresist layer according to the shape of the etching area; and dry-etching the etch stop layer using the photoresist pattern (figures 5b and 5c).

In re claim 6, Chan discloses wherein the first and second silica layers are formed by deposition (figure 5).

In re claim 8, Chan discloses wherein the second silica layer is removed according to a predetermined vertical profile (figure 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Barnes et al. (U. S. patent 5,284,549).

In re claim 4, Chan does not disclose wherein the etch stop layer is formed of one of metal and ceramic.

However, Barnes in the U. S. patent 5,284,549 discloses wherein a ceramic layer (Al_2O_3) has a high etching ratio compared to SiO_2 (desirable ratio of 20:1) (column 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the etch stop layer of Chan with a ceramic material since, as taught by Barnes, it poses a high etching ratio compared to silica (ratio of 20:1).

In re claim 7, Chan does not disclose wherein the second silica layer is etched by RIE.

However Barnes discloses that RIE etching has a high selectivity to silica (column 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to etch the second silica layer by RIE in the invention of Chan, since as taught by Barnes, RIE has a high selectivity to silica.

In re claim 9, Chan discloses wherein the second layer is removed according to a predetermined vertical profile (figure 5).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Young et al. (U. S. patent 6,268,287 B1).

Chan discloses forming a poly-silicon layer on the second silica layer by sputtering; forming a photoresist layer on the poly layer; patterning the photoresist layer according to the shape of the etching area; and etching the poly layer using a photoresist pattern (figure 5).

Chan does not disclose wherein the mask layer is a metal layer.

However Young discloses that a mask layer formed with a metal layer will prevent forming a polymer on the layer underneath the hard mask since it does not interact with the photoresist (abstract).

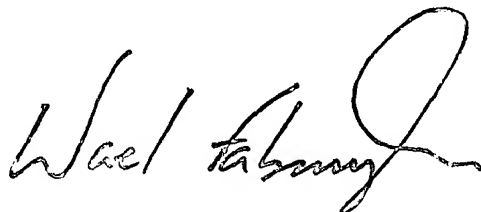
It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the mask layer of Chan with metal, since, as taught by Young, it will prevent formation of a polymer on the layer underneath the hard mask since it does not interact with the photoresist.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando Toledo whose telephone number is 703-305-0567. The examiner can normally be reached on Mon-Fri 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Fernando Toledo
Examiner
Art Unit 2823

SUPPLEMENTARY PRIMARY EXAMINER
TECHNOLOGY CENTER
ft
July 12, 2002